Rocky Flats Environmental Technology Site

PRE-DEMOLITION SURVEY REPORT (PDSR)

BUILDING B771 Exhaust Stack

REVISION 0

June 9, 2004

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1/45

PRE-DEMOLITION SURVEY REPORT (PDSR)

BUILDING 771 Exhaust Stack

REVISION 0

June 9, 2004

Prepared by: _____ Date: 6-8-04
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Approved by: _____ Date: 6/9/04
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ATTACHMENTS

ABBREVIATIONS/ACRONYMS

ACM	Asbestos Containing Material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
$DCGL_{EMC}$	Derived Concentration Guideline Level – elevated measurement comparison
$DCGL_W$	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
HEUN	Highly Enriched Uranyl Nitrate
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
PDSR	Pre-demolition survey report
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSA	Removable Surface Activity
RSOP	RFCA Standard Operating Protocol
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity

VOCs	Volatile organic compounds
WSRIC	Waste Stream and Residue Identification and Characterization

EXECUTIVE SUMMARY

A Pre-Demolition Survey was performed to enable compliant disposition and waste management of the Building 771 Exhaust Stack. Because this Type 3 area will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). Surfaces characterized as part of this PDS include the lower 24' of the Building 771 exhaust stack (base to 24' elevation). The remaining surfaces of the stack (i.e., surfaces above 24' elevation) have previously been demonstrated to meet unrestricted release limits via remote survey (documented in the Eberline Services Rocky Flats Environmental Test Site Building 771 Stack LARADS Radiological Survey Report). This PDS does NOT include the exhaust tunnel leading to the 771 stack.

The PDS encompassed both chemical and radiological characterization. The characterization was built upon physical, chemical and radiological hazards identified in the facility-specific *B771 and B774 Hazards Characterization Report for the 771 Closure Project.*

Based upon the results of this PDSR, the Building 771 Exhaust Stack meets the unrestricted release limits specified in the site Pre-Demolition Survey Plan, and the concrete can be used for backfill on-site per the 771 Closure Project Decommissioning Operations Plan. To ensure that the facility remains free of contamination and PDS data remain valid, Level 2 isolation controls are established, however, the area will not be posted because personnel do not routinely access these areas.

1 INTRODUCTION

A Pre-Demolition Survey was performed to enable compliant disposition and waste management of the Building 771 Exhaust Stack. Because this Type 3 area will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). Surfaces characterized as part of this PDS include the lower 24' of the Building 771 exhaust stack (base to 24' elevation). The remaining surfaces of the stack (i.e., surfaces above 24' elevation) have previously been demonstrated to meet unrestricted release limits via remote survey (documented in the Eberline Services Rocky Flats Environmental Test Site Building 771 Stack LARADS Radiological Survey Report). This PDS does NOT include the exhaust tunnel leading to the 771 stack.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. Among these is the Building 771 Exhaust Stack. This facility no longer supports the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before this Type 3 facility can be demolished, the Data Quality Objectives (DQOs) for a Pre-Demolition Survey (PDS) must be satisfied; this document presents the PDS results for the lower 24' of the Building 771 Exhaust Stack. The PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The PDS is built upon physical, chemical and radiological hazards identified in the facility-specific *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0.

1.1 Purpose

The purpose of this report is to communicate and document the results of the Building 771 Exhaust Stack PDS effort. A PDS is performed prior to building demolition to define the pre-demolition radiological and chemical conditions of a facility. The pre-demolition conditions are compared with the release limits for radiological and non-radiological contaminants. PDS results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 Scope

This report presents the pre-demolition radiological and chemical conditions of the lower 24' of the Building 771 Exhaust Stack. The remaining surfaces of the stack (i.e., surfaces above 24' elevation) have previously been demonstrated to meet unrestricted release limits via remote survey (documented in the Eberline Services Rocky Flats Environmental Test Site Building 771 Stack LARADS Radiological Survey Report). This PDS does NOT include the exhaust tunnel leading to the 771 stack.

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1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this PDS were the same DQOs identified in the Section 2.0 of the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to section 2.0 of MAN-127-PDSP for these DQOs.

2 HISTORICAL SITE ASSESSMENT

A facility-specific Hazards Characterization Report was conducted to understand the facility history and related hazards. The Building 771 Hazards Characterization was performed in June 2001 (Refer *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0). Based on the characterization results, radiological contamination was identified in the lower elevations of the Building 771 exhaust stack (elevations below 24') and the stack was identified as a Type 3 facility. Therefore, a PDS was required before demolition of the facility.

This report documents the results of that PDS. The hazards characterization results and historical review (refer to Attachment D) were used to identify PDS data gaps and needs, and to develop radiological and chemical PDS characterization packages. Characterization documentation is located in the Building 771 Characterization Project files.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Contamination up to 6200 dpm/100 cm^2 fixed alpha was detected in the lower portions of the stack during characterization efforts. Therefore, high-pressure water was used to decontaminate all suspect surfaces (i.e., from base to 24' elevation) prior to the performance of the PDS survey.

The Building 771 Exhaust Stack was characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern (weapons-grade plutonium isotopes). Based upon a review of the characterization data, historical and process knowledge, in-process survey data, building walk-downs, and PDSP guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to survey package 771037). A Survey Unit Overview Map is presented in Attachment A. Based on hazard characterization data and historical and process knowledge, transuranic isotopes are the primary contaminants of concern in Buildings 771/774 and in the Building 771 Exhaust Stack. Therefore, the PDS was performed to the transuranic PDS unrestricted release criteria. Individual radiological survey unit packages are maintained in the Building 771 Characterization Project files.

The Building 771 Exhaust Stack survey unit package was developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure.* Total surface activity (TSA) and removable surface activity (RSA) measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures.* Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological*

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Survey/Sample Data Analysis. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*. Radiological survey data, statistical analysis results, and survey locations are presented in Attachment A, *Radiological Data Summary and Survey Maps*.

Building 771 Exhaust Stack - (Survey Unit 771037)

The lower portion of the Building 771 Exhaust Stack (base to 24' elevation) was classified as a Class 1 survey unit based on contamination potential from the 1957 fire. A total of 15 random TSA and RSA measurements were collected. Surface scans of 129 m^2 (100% of total surface area) were performed.

The remaining surfaces of the stack (i.e., surfaces above 24' elevation) have previously been demonstrated to meet unrestricted release limits via remote survey (documented in the Eberline Services Rocky Flats Environmental Test Site Building 771 Stack LARADS Radiological Survey Report).

Radiological survey data, statistical analysis results, survey locations, and radiological scan maps for survey unit 771037 are presented in Attachment A, *Survey Unit 771037 Radiological Data Summary and Survey Map*.

Additional Radiological Considerations

The exhaust tunnel adjacent to the Building 771 Exhaust Stack will not be free-released. The upper portions of the tunnel (i.e., surface within 6' of final grade) will be removed and disposed of as low-level radiological waste. The exhaust tunnel will not be disturbed during stack demolition.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

4.1 Asbestos

There is no asbestos-containing building material in the Building 771 Exhaust Stack.

4.2 Beryllium (Be)

The Building 771 Exhaust Stack is not and has never been a beryllium-controlled area. However, because low levels of radiological contamination were detected during characterization efforts in the lower portions of the stack, ten (10) biased beryllium smears were collected. All results were less than the action level of 0.1 $\mu g/100\ cm^2$.

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

The Building 771 Exhaust Stack has never contained RCRA storage units. A visual inspection of the area by Environmental Compliance and Industrial Hygiene personnel

verified the absence of hazardous waste residuals and/or stains on the surfaces. Therefore, no sampling was required for RCRA/CERCLA contaminants.

4.4 Polychlorinated Biphenyls (PCBs)

Free-flowing or exposed PCBs have never been used or transferred through the Building 771 Exhaust Stack. Therefore, no sampling was required for PCBs.

5 PHYSICAL HAZARDS

Physical hazards associated with the Building 771 Exhaust Stack include those common to standard industrial environments, and include trips and falls and lighting concerns. The exhaust tunnel leading to the stack has been partially removed, and personnel should be aware of the potential for jagged metal surfaces in the immediate vicinity of removal. There are no other unique hazards associated with the area. The stack is in good physical condition, therefore, does not present hazards associated with structural deterioration.

Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of the Building 771 Exhaust Stack, and consequent waste management, is of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments A and B) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original project DQOs.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- the *number* of samples and surveys;
- the *types* of samples and surveys;
- the sampling/survey process as implemented "in the field"; and
- the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are presented in Attachment C. The DQA Checklists are provided in the individual survey unit packages (located in the Building 771 Characterization Files).

The Minimum Detectable Activity (MDA) for each PDS instrument was determined *a priori* based on typical parameters (background, efficiency, and count time). A list of radiological field instrumentation and associated sensitivities is presented in Table 1. This table is based on Section 5.1 of the MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.

Table 1

PDS Radiological Field Instrumentation and Minimum Detectable Activities

Model	Measurement Type	MDA (dpm/100 cm^2)
NE Electra DP6	TSA	48
Eberline SAC-4	Removable (Smears)	10

7 DECOMMISSIONING WASTE TYPES

The demolition and disposal of Building 771 Exhaust Stack will generate concrete rubble that may be used as backfill onsite in accordance with the 771 Closure Project Decommissioning Operations Plan.

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, the Building 771 Exhaust Stack is classified as an RFCA Type 3 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999). Based upon the results of this PDSR, the Building 771 Exhaust Stack meets the unrestricted release limits specified in the site Pre-Demolition Survey Plan. The applicable limits are as follows:

Table 2
PDSP Table 7-1 Surface Contamination Limits

Radionuclides	Total Average (dpm/100 cm^2) (1) ($DCGL_W$)	Total Maximum (dpm/100 cm^2) (2) ($DCGL_{EMC}$)	Removable (dpm/100 cm^2) ($DCGL_W$)
Transuranics	100	300	20

(1) Measurements of average contamination should not be averaged over an area of more than 1 m^2.
(2) The maximum contamination level applies to an area of not more than 100 cm^2.

The concrete can be used for backfill on-site per 771 Closure Project Decommissioning Operations Plan. The PDS for the Building 771 Exhaust Stack was performed in accordance with the DDCP and PDSP, all PDSP DQOs were met, and all data satisfied the PDSP DQA criteria.

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9 REFERENCES

B771 and B774 Hazards Characterization Report for the 771 Closure Project, dated June 12, 2001, Revision 0.

DOE/RFFO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA)*, July 19, 1996.

DOE Order 5400.5, *Radiation Protection of the Public and the Environment*

DOE Order 414.1A, *Quality Assurance*

EPA, 1994. *The Data Quality Objective Process,* EPA QA/G-4.

K-H, 1999. *Decommissioning Program Plan*, June 21, 1999.

MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.

MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.

MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 4, July 15, 2002.

MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.

MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual* (NUREG-1575, EPA 402-R-97-016).

PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure,* Rev. 1, May 22, 2001.

PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 2, March 10, 2003.

PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.

PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-563-ACPR, *Asbestos Characterization Procedure,* Revision 0, August 24, 1999.

PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.

RFETS, Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.

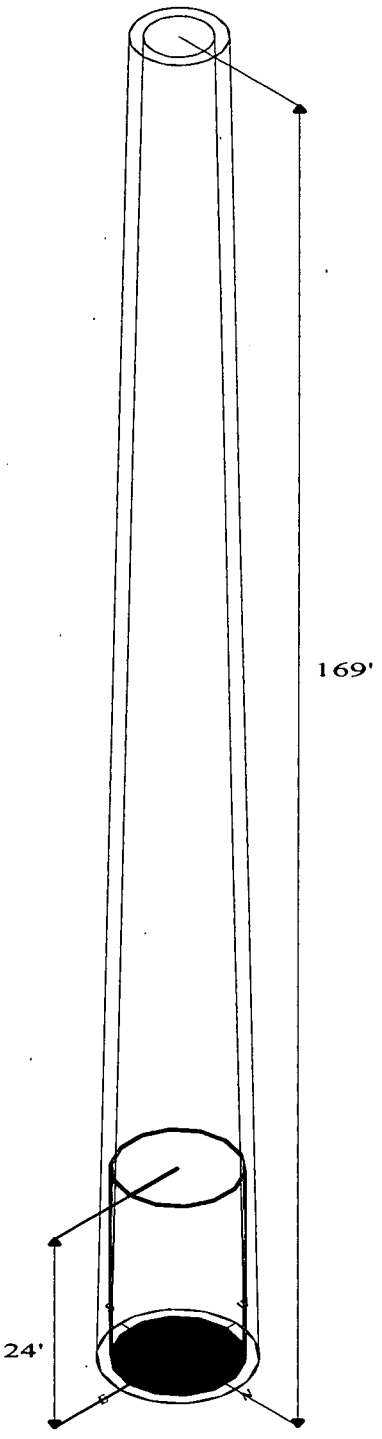
RFETS, Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.

RFETS, RFCA RSOP for Recycling Concrete, September 28, 1999

ATTACHMENT A

Survey Unit 771037
Radiological Data Summary and Survey Unit Overview Maps

B771 Stack



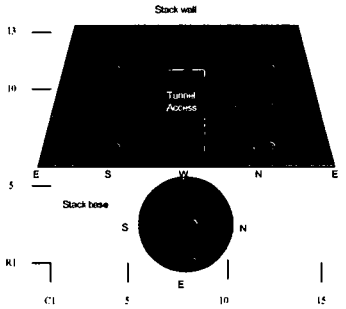
Survey Unit
771037 [redacted]

RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

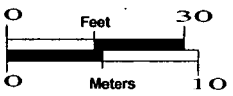
Survey Area: AG **Survey Unit: 771037** **Classification: 1**
Building: 771
Survey Unit Description: Main Exhaust Stack

Total Floor Area: 19 sq. m **Total Area: 110 sq. m** **Grid Size: 2m x 2m**

SURVEY UNIT 771037 - MAP 1 OF 1



Completed hand scans
Area scanned = 110 sq. m.
Percent of Total Area = 100 %



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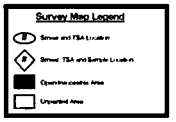

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Survey Area: AG	Survey Unit: 771037	Building: 771
Description: Bldg. 771 Exhaust Stack		

Rocky Flats Environmental Technology Site
Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 0 | Nbr QC Required: 0

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 0 | Nbr QC Performed: 2

Alpha

Maximum:	94.1 dpm/100cm²
Minimum:	7.4 dpm/100cm²
Mean:	47.1 dpm/100cm²
Standard Deviation:	24.7
QC Maximum:	34.4 dpm/100cm²
QC Minimum:	34.4 dpm/100cm²
QC Mean:	34.4 dpm/100cm²
Transuranic $DCGL_W$:	100.0 dpm/100cm²
Transuranic $DCGL_{EMC}$:	300.0 dpm/100cm²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 0

Alpha

Maximum:	1.5 dpm/100cm²
Minimum:	-1.5 dpm/100cm²
Mean:	0.2 dpm/100cm²
Standard Deviation:	1.0
Transuranic $DCGL_W$:	20.0 dpm/100cm²

Media Sample Results

Nbr Random Required: 0 | Nbr Biased Required: 0

Nbr Random Collected: 0 | Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

Survey Area: AG	Survey Unit: 771037	Building: 771

Description: Bldg. 771 Exhaust Stack

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	515011	06/03/04	Electra	399	DP-6	09/23/04	0.222	NA	48.0	NA	T
2	515011	06/04/04	Electra	399	DP-6	09/23/04	0.222	NA	48.0	NA	T
3	515011	06/07/04	Electra	1262	DP-6	11/24/04	0.220	NA	48.0	NA	T
4	515011	06/03/04	SAC-4	850	NA	07/27/04	0.333	NA	10.0	10.0	R
5	515011	06/03/04	SAC-4	1354	NA	09/18/04	0.333	NA	10.0	10.0	R
6	516635	06/07/04	SAC-4	850	NA	07/27/04	0.333	NA	10.0	10.0	R
7	516572	06/07/04	SAC-4	1053	NA	07/22/04	0.333	NA	10.0	10.0	R
8	516572	06/07/04	Electra	399	DP-6	09/23/04	0.222	NA	48.0	NA	T/I

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: AG	Survey Unit: 771037	Building: 771
Description: Bldg. 771 Exhaust Stack		

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
771037PRP-N001	4	1.2	N/A	
771037PRP-N002	5	0.0	N/A	
771037PRP-N003	4	-0.3	N/A	
771037PRP-N004	5	-1.5	N/A	
771037PRP-N005	4	-0.3	N/A	
771037PRP-N006	5	1.5	N/A	
771037PRP-N007	4	1.2	N/A	
771037PRP-N008	5	-1.5	N/A	
771037PRP-N009	4	-0.3	N/A	
771037PRP-N010	5	0.0	N/A	
771037PRP-N011	4	1.2	N/A	
771037PRP-N012	5	0.0	N/A	
771037PRP-N013	4	1.2	N/A	
771037PRP-N014	5	0.0	N/A	
771037PRP-N015	6	0.9	N/A	

Comments:

Survey Area: AG	Survey Unit: 771037	Building: 771
Description: Bldg. 771 Exhaust Stack		

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
771037PRP-N001	1	52.5	N/A	
771037QRP-N001	8	34.4	N/A	
771037PRP-N002	1	58.3	N/A	
771037QRP-N002	8	34.4	N/A	
771037PRP-N003	1	16.4	N/A	
771037PRP-N004	1	19.6	N/A	
771037PRP-N005	1	58.3	N/A	
771037PRP-N006	1	58.3	N/A	
771037PRP-N007	1	61.5	N/A	
771037PRP-N008	2	37.6	N/A	
771037PRP-N009	2	16.4	N/A	
771037PRP-N010	2	7.4	N/A	
771037PRP-N011	2	46.6	N/A	
771037PRP-N012	2	40.3	N/A	
771037PRP-N013	2	82.6	N/A	
771037IRP-N014	8	94.1	N/A	
771037PRP-N015	3	56.2	N/A	

Comments:

ATTACHMENT B

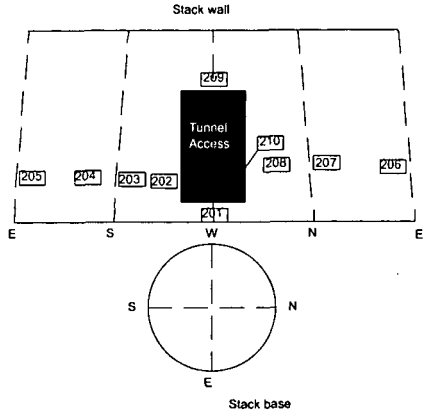
Chemical Data Summaries and Sample Maps

BERYLLIUM CHARACTERIZATION SURVEY FOR THE 771 CLUSTER

Survey Area: AG **Survey Unit: 771037 Be** **Classification: NA**
Building: 771
Survey Unit Description: Main Exhaust Stack

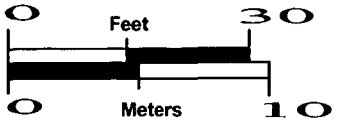
Total Floor Area: 201 sq. ft **Total Area: NA** **Grid Size: NA**

SURVEY UNIT 771037 Be - MAP 1 OF 1



Sample location	Sample Number	Sample Result
201 thru 210	771-06-01-2004-76-201 thru 210	<0.1 ug/100 sq. cm
	771-06-01-2004-76-211 thru 212	Blanks

Best Available Copy



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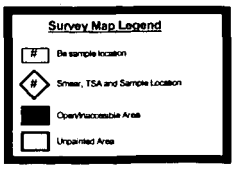

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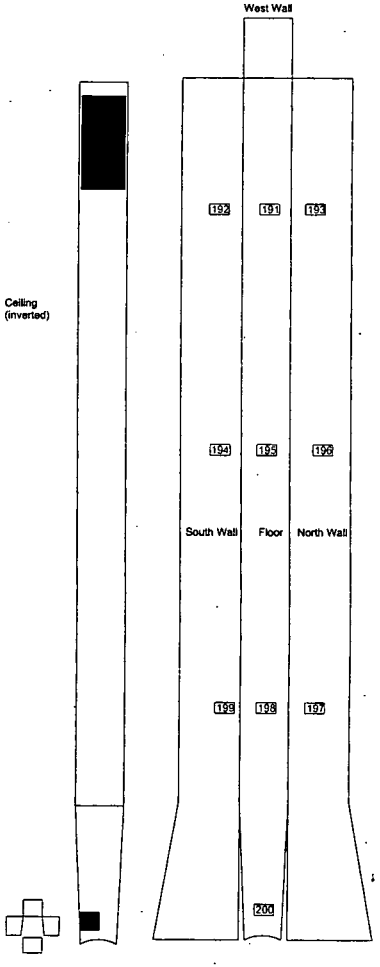
BERYLLIUM CHARACTERIZATION SURVEY FOR THE 771 CLUSTER

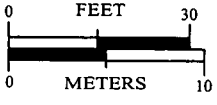
Survey Area: AG **Survey Unit: 771106 Be** **Classification: NA**
Building: 771
Survey Unit Description: Exhaust Stack Tunnel

Total Floor Area: 1122 sq. ft. **Total Area: NA** **Grid Size: NA**

SURVEY UNIT 771106 Be - MAP 1 OF 1



Sample location	Sample Number	Sample Result
191 thru 200	771-06-01-2004-76-191 thru 200	<0.1 ug/100 sq. cm
	771-06-01-2004-76-211 thru 212	Blanks



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SURVEY MAP LEGEND

Industrial Hygiene Information System
Surface Sample Report

IHISR_SURFACE_SAMPLE
Date: 06/03/2004

RIN: 04D0831

Sample Number/Type: 771-06012004-76-191 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL FLOOR APPROX 12 METERS EAST OF STAIRS
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-192 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL SOUTH WALL APPROX 12 METERS EAST OF STAIRS
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-193 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL NORTH WALL APPROX 12 METERS EAST OF STAIRS
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-194 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL SOUTH WALL APPROX 25 METERS EAST OF STAIRS
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-195 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL FLOOR APPROX 25 METERS EAST OF STAIRS
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-196 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL NORTH WALL APPROX 25 METERS EAST OF STAIRS
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-197 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL NORTH WALL APPROX 50 METERS EAST OF STAIRS
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-198 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL NORTH WALL APPROX 25 METERS EAST OF STAIRS
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-199 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL SOUTH WALL: APPROX 50 METERS EAST OF STAIRS
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-200 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL FLOOR APPROX 65 METERS EAST OF STAIRS
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-201 WIPE Hygienist: TONYA BEAN
Location Info: STACK FLOOR, WEST SIDE
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-202 WIPE Hygienist: TONYA BEAN

[redacted]

Industrial Hygiene Information System
Surface Sample Report

IHISR_SURFACE_SAMPLE

Date: 06/03/2004

RIN: 04D0831

Sample Number/Type: 771-06012004-76-202 WIPE Hygienist: TONYA BEAN
Location Info: STACK WALL APPROX 3 METERS SOUTHWEST OF STACK ENTR
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-203 WIPE Hygienist: TONYA BEAN
Location Info: STACK WALL APPROX 7 METERS SOUTHWEST OF STACK ENTR
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-204 WIPE Hygienist: TONYA BEAN
Location Info: STACK WALL APPROX12 METERS SOUTHWEST OF STACK ENTR
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-205 WIPE Hygienist: TONYA BEAN
Location Info: STACK WALL EAST SIDE
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-206 WIPE Hygienist: TONYA BEAN
Location Info: STACK WALL 3 METERS NORTH
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-207 WIPE Hygienist: TONYA BEAN
Location Info: STACK WALL NORTH SIDE
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-208 WIPE Hygienist: TONYA BEAN
Location Info: STACK WALL 3 METERS WEST
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-209 WIPE Hygienist: TONYA BEAN
Location Info: STACK WALL WEST SIDE
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-210 WIPE Hygienist: TONYA BEAN
Location Info: TUNNEL FLOOR AT ENTRANCE TO STACK
Room No: N/A
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG/100CM2

Sample Number/Type: 771-06012004-76-211B BLANK Hygienist: TONYA BEAN
Location Info:
Room No:
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG

Sample Number/Type: 771-06012004-76-212B BLANK Hygienist: TONYA BEAN
Location Info:
Room No:
Analyte: BERYLLIUM AND BE COMPOUNDS (AS BE)
Concentration: < 0.1000 _ UG

[redacted]

ATTACHMENT C

Data Quality Assessment

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table E-1, and beryllium in E-2. A data completeness summary for all results is given in Table E-3.

All relevant Quality records supporting this report are maintained in the B771 Characterization Project Files. This report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic $DCGL_w$ (100 dpm/100cm^2).

SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification.

Based upon an independent review of the radiological data, it is determined that the original project DQOs satisfied site PDSP guidance. All facility contamination levels were below applicable unrestricted release levels, except as noted above. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable procedures, survey units were properly designed and bounded, and instrument performance and calibration were within acceptable limits.

Level 2 Isolation Controls have been implemented to prevent the inadvertent introduction of further contamination into the facility. On this basis, the B771 Exhaust Stack meets the RLCP and PDSP DQO criteria with the confidences stated herein.

Table E-1 V&V of Radiological Surveys – B771 Exhaust Stack

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
Parameters		Measure	Frequency	COMMENTS
ACCURACY	initial calibrations	80%<x<120 %	≥1	Calibration using Alpha Group procedure and approved technicians.
	daily source checks	80%<x<120 %	≥1/day	Performed daily/within range.
	local area background: Field	typically < 10 dpm	≥1/day	All local area backgrounds were within expected Ranges <10 cpm
PRECISION	field duplicate measurements for TSA	≥5% of real survey points	≥100% packages	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Unit 771037	statistical	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	units of measure	dpm/100cm^2	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	detection limits	TSA: ≤50 dpm/100cm^2 RA: ≤10 dpm/100cm^2	all measures	MDAs ≤ ½ $DCGL_w$ per MARSSIM guidelines.

Table E-2 V&V of Beryllium Results – B771 Exhaust Stack

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
BERYLLIUM	**Prep: NMAM 7300** **METHOD: OSHA ID-125G**	**LAB ---->**	Johns Manville Corp. Denver, Co.	
QUALITY REQUIREMENTS		**RIN ---->**	RIN 771-06012004-76-201 thru 210	
		Measure	**Frequency**	**COMMENTS**
ACCURACY	**Calibrations** Initial	linear calibration	≥1	No qualifications significant enough to change project decisions, i.e., classification of Type 3 facilities confirmed. All results were below associated action levels.
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks - lab & field	<MDL	≥1	
	interference check std (ICP)	NA	NA	
PRECISION	Laboratory Control Sample Duplicate	80%<%R<120% (RPD<20%)	≥1	
	field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	measurement units	ug/100cm^2	NA	
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	detection limits	MDL of 0.10ug/100cm^2	all measures	

Table E-3 Data Completeness Summary – B771 Exhaust Stack

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC)[A]	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Beryllium	B774 Interior	10 biased (interior) 2 Blanks	10 biased (interior) 2 Blanks	No beryllium contamination found at any location, all results below the regulatory limit	OSHA ID-125G RIN 771-06012004-76-201 thru 210 No results above action level (0.2ug/100cm^2) or investigative level (0.1ug/100cm^2).
Radiological	Survey Area: AG Survey Unit: 771037 B771 Exhaust Stack	15 α TSA (15 – Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 15 Media 100% scanned	15 α TSA (15 – Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 15 Media 100% scanned	No elevated contamination at any location; all values below PDS unrestricted release levels No result above action level	Transuranic DCGLs No result above action level

ATTACHMENT D

Historical Review

Building 771 Exhaust Stack
Historical Review
June 8, 2004

Facility ID: Building 771 Exhaust Stack (Survey Unit 771037)

Anticipated Facility Type (1, 2, or 3): Type 3.

Physical Description: The Exhaust Stack of Building 771 is a reinforced concrete stack at the southeast corner of B771. The stack has an inside diameter of 17 feet, the base is 19 feet underground, and the stack rises 150 feet aboveground. The stack wall is 6 inches thick at the top and 11.5 inches thick at the base.

Historical Operations:
The B771 Stack, built in 1953, provided exhaust for the main filter plenum, which received exhaust from the high-efficiency particulate air (HEPA) filtration system; the heating, ventilation, and air conditioning (HVAC) system; and incinerator.

Current Operational Status: The Building 771 Exhaust Stack is no longer in operation. A section of the 771 exhaust tunnel leading to the stack was removed, thus isolating the stack from building exhaust.

Contaminants of Concern

Asbestos
None

Beryllium (Be)
The interior and the exterior of the Exhaust Stack has never been posted/controlled as a Beryllium (Be) Area, based on historical and existing classifications and historical use. Personnel interviews confirm that the stack was never a Beryllium area

Lead

None

RCRA/CERCLA Constituents
Personnel interviews indicate that RCRA storage units were never located in this area.

A visual inspection of the 771 Exhaust Stack by Building 771774 Environmental Compliance/Industrial Hygiene personnel verified the absence of hazardous waste residuals and/or stains on the floor/concrete slab, walls. As a result of these observances, it has been determined that no sampling for RCRA/CERCLA constituents is required.

PCBs
Free-flowing or exposed PCBs have never been used or transferred in the Exhaust Stack.

Radiological Contaminants
The contaminants of concern for the 771 project, including all areas of Buildings 771 and 774, are transuranic alpha-emitting radioisotopes (including Pu-238, Pu-239/240, Pu-242, and Am-241). Based on findings documented in Radiological Engineering TBD-00161, Rev. 0, alpha-only surveys assure that the unrestricted-release limits for any other isotopes that may exist in Building 771/774 will not be exceeded.

The potential for radiological contamination does exist for the Building 771 Exhaust Stack due to the 1957 fire, when several of the building HEPA filters caught fire thus allowing for the potential release of contamination from the building.

Building 771 Exhaust Stack
Historical Review
June 8, 2004

Environmental Restoration Concerns

No Individual Hazardous Substance Sites (IHSS) exist beneath the Building 771 Exhaust Stack.

Additional Information

None

References

(1) *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0.

(2) *Building 771/774 Cluster Closure Project Reconnaissance Level Characterization Report*, dated August 8, 1998, Revision 2.

Further Actions

Complete the PDS process.

Prepared By: T. Fontaine / [signature] / 6-8-04

Name Signature Date

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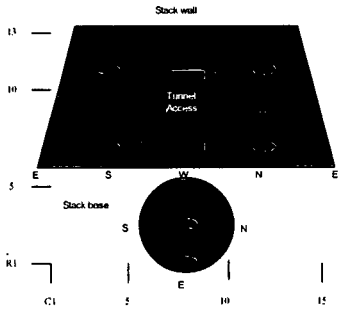
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AG **Survey Unit: 771037** **Classification: 1**
Building: 771
Survey Unit Description: Main Exhaust Stack

Total Floor Area: 19 sq. m **Total Area: 110 sq. m** **Grid Size: 2m x 2m**

SURVEY UNIT 771037 - MAP 1 OF 1



Completed hand scans
Area scanned = 110 sq. m.
Percent of Total Area = 100 %

0 Feet 30
0 Meters 10

N

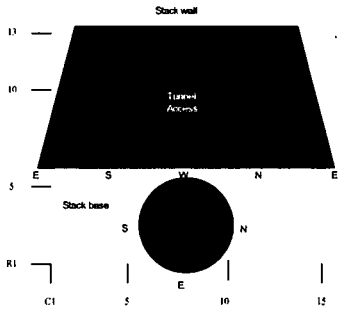
Survey Map Legend
Smear and TSA Location
Smear, TSA and Sample Location
Quantifiable Area
Unpainted Area

RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AG **Survey Unit: 771037** **Classification: 1**
Building: 771
Survey Unit Description: Main Exhaust Stack

Total Floor Area: 19 sq. m **Total Area: 110 sq. m** **Grid Size: 2m x 2m**

SURVEY UNIT 771037 - MAP 1 OF 1



Completed hand scans
Area scanned = 110 sq. m.
Percent of Total Area = 100 %

0 Feet 30
0 Meters 10

N

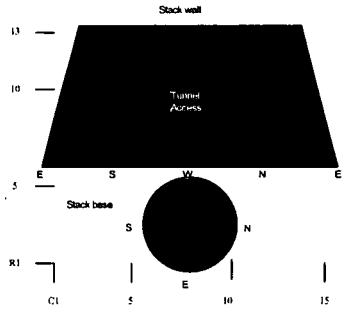
Survey Map Legend
Sensor and TBA Location
Sensor, TBA and Sample Location
Unsurveyed Area

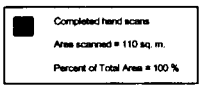
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

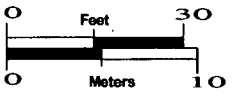
Survey Area: AG **Survey Unit: 771037** **Classification: 1**
Building: 771
Survey Unit Description: Main Exhaust Stack

Total Floor Area: 19 sq. m **Total Area: 110 sq. m** **Grid Size: 2m x 2m**

SURVEY UNIT 771037 - MAP 1 OF 1







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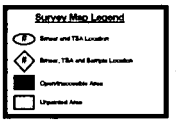


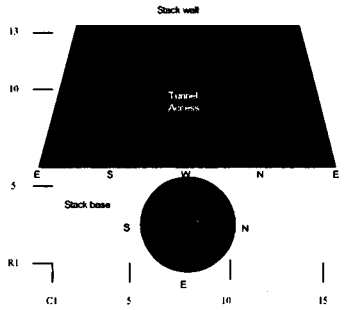
35

RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AG **Survey Unit: 771037** **Classification: 1**
Building: 771
Survey Unit Description: Main Exhaust Stack

Total Floor Area: 19 sq. m **Total Area: 110 sq. m** **Grid Size: 2m x 2m**

SURVEY UNIT 771037 - MAP 1 OF 1



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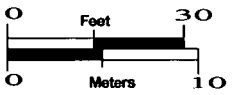
Percent of Total Area = 100 %



N

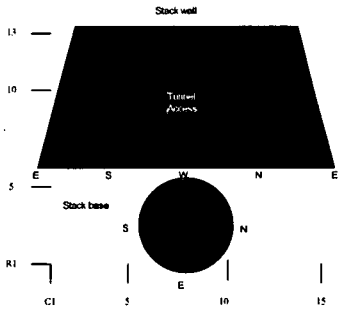
Survey Map Legend
Sensor and TBA Location
Sensor, TBA and Sample Location
Open/Inaccessible Area
Unpainted Area

RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AG **Survey Unit: 771037** **Classification: 1**
Building: 771
Survey Unit Description: Main Exhaust Stack

Total Floor Area: 19 sq. m **Total Area: 110 sq. m** **Grid Size: 2m x 2m**

SURVEY UNIT 771037 - MAP 1 OF 1



Completed hand scans
Area scanned = 110 sq. m.
Percent of Total Area = 100 %

0 Feet 30
0 Meters 10

N

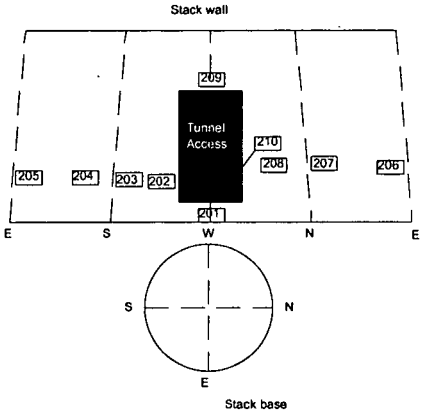
Survey Map Legend

BERYLLIUM CHARACTERIZATION SURVEY FOR THE 771 CLUSTER

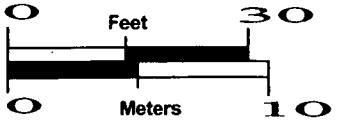
Survey Area: AG **Survey Unit: 771037 Be** **Classification: NA**
Building: 771
Survey Unit Description: Main Exhaust Stack

Total Floor Area: 201 sq. ft **Total Area: NA** **Grid Size: NA**

SURVEY UNIT 771037 Be - MAP 1 OF 1



Sample location	Sample Number	Sample Result
201 thru 210	771-06-01-2004-76-201 thru 210	<0.1 ug/100 sq. cm
	771-06-01-2004-76-211 thru 212	Blanks



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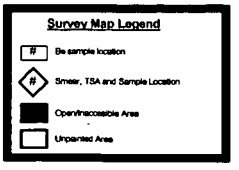
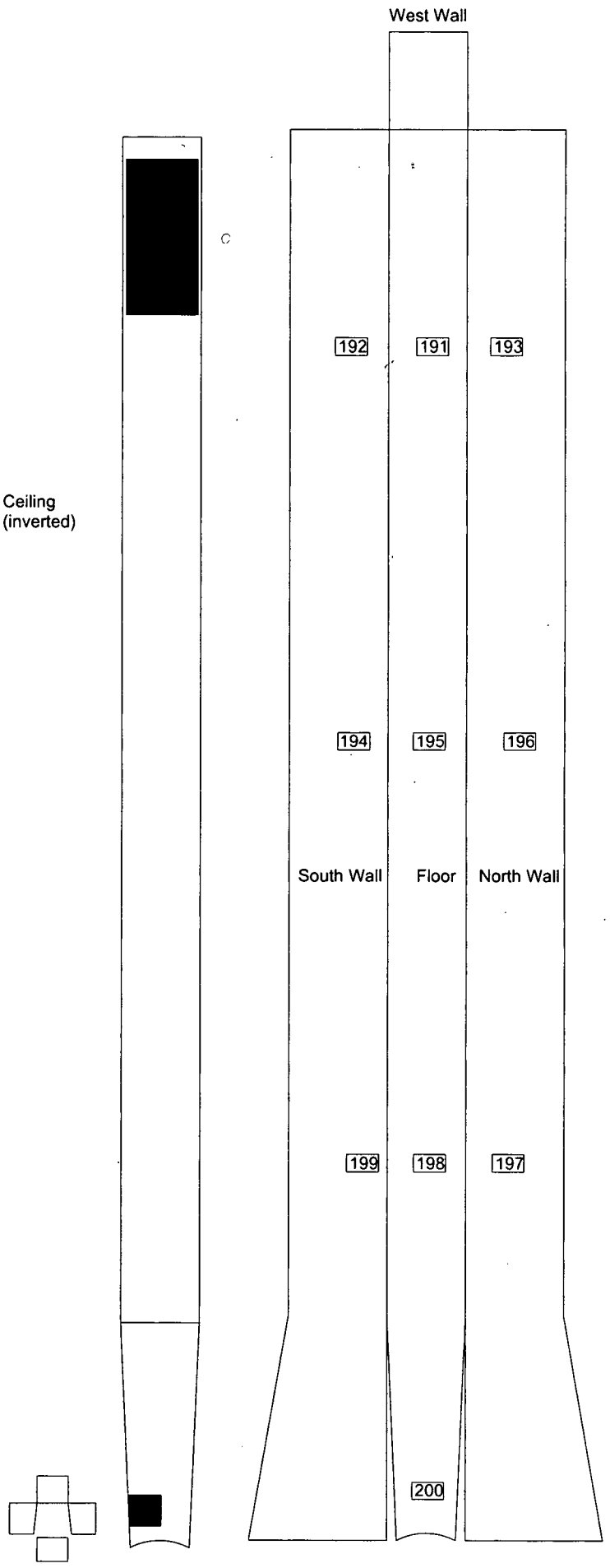


BERYLLIUM CHARACTERIZATION SURVEY FOR THE 771 CLUSTER

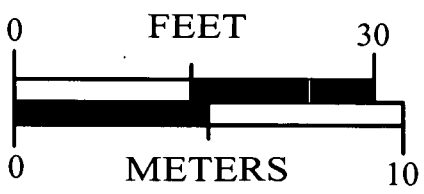
Survey Area: AG **Survey Unit: 771106 Be** **Classification: NA**
Building: 771
Survey Unit Description: Exhaust Stack Tunnel

Total Floor Area: 1122 sq. ft. **Total Area: NA** **Grid Size: NA**

SURVEY UNIT 771106 Be - MAP 1 OF 1



Sample location	Sample Number	Sample Result
191 thru 200	771-06-01-2004-76-191 thru 200	<0.1 ug/100 sq. cm
	771-06-01-2004-76-211 thru 212	Blanks



N

SURVEY MAP LEGEND

- # Be Smears
- Open/Inaccessible Area
- Area in Another Location

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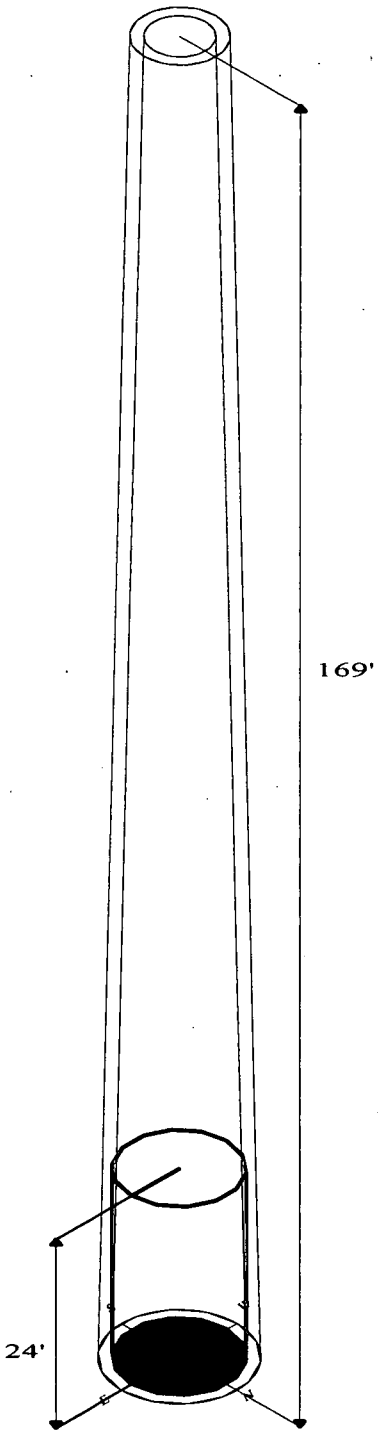
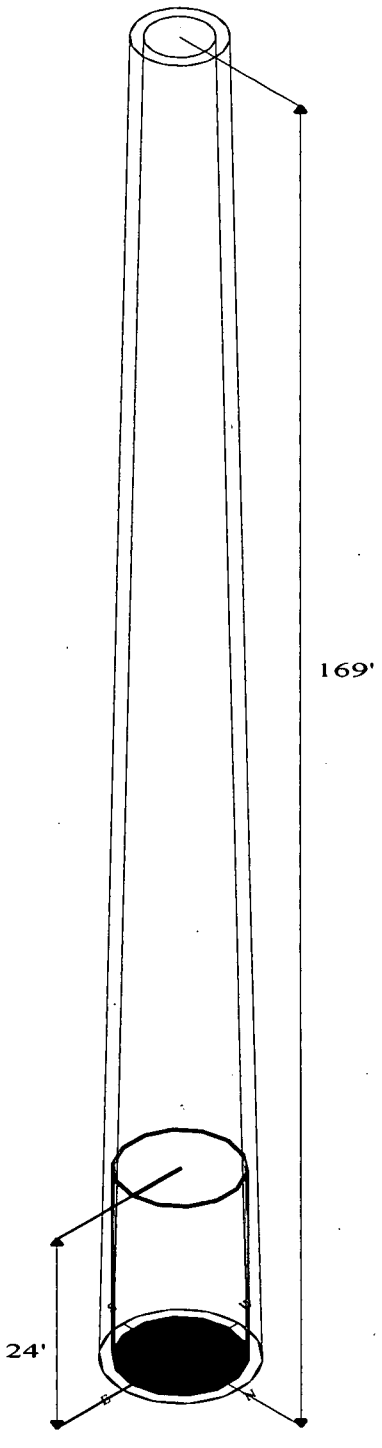
B771 Stack



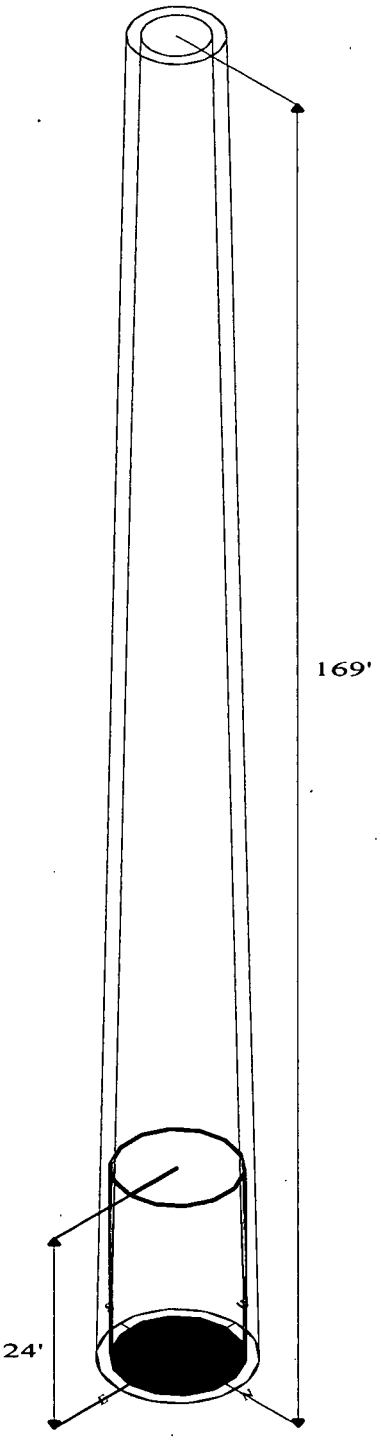
Survey Unit
771037 [redacted]

B771 Stack



Survey Unit
771037 [redacted]

B771 Stack



Survey Unit
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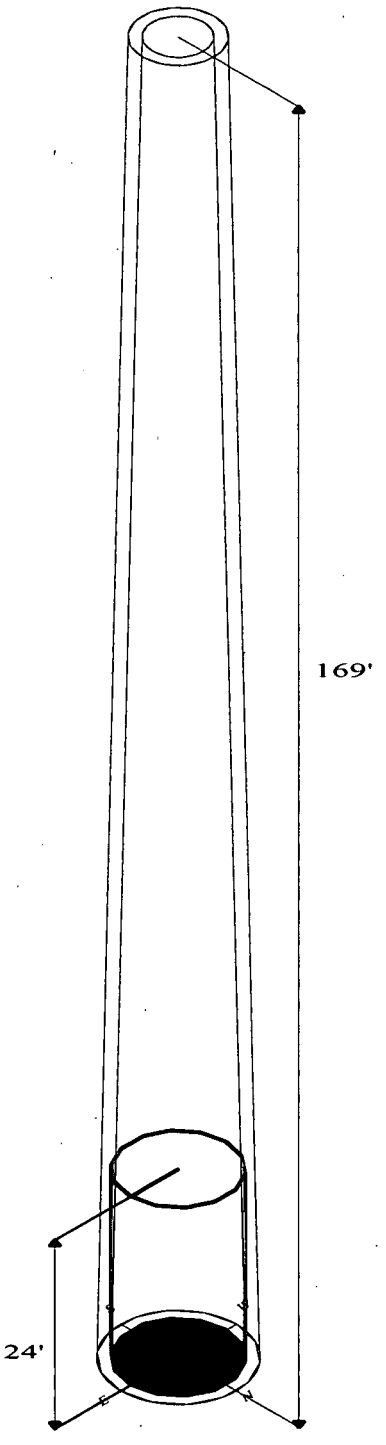
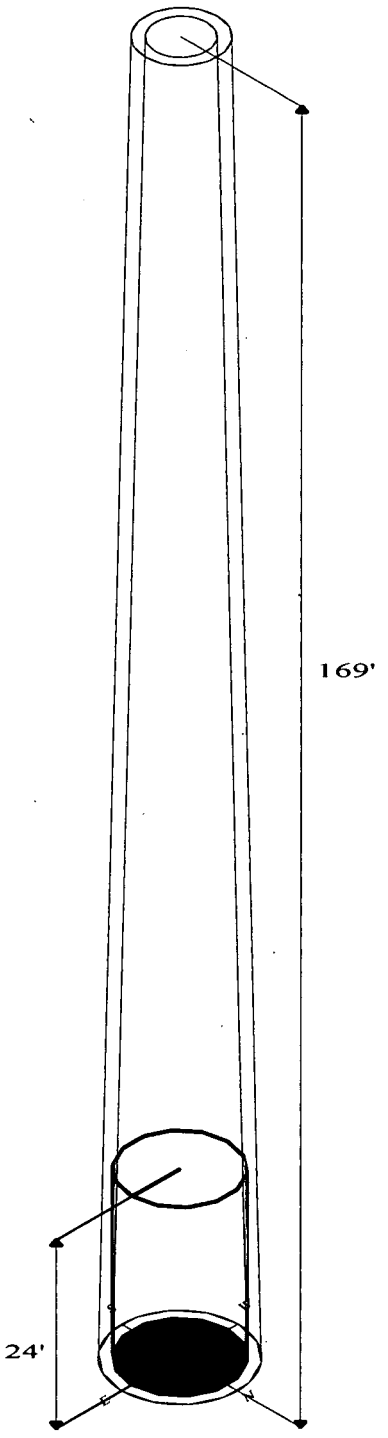
B771 Stack



Survey Unit
771037

B771 Stack



Survey Unit
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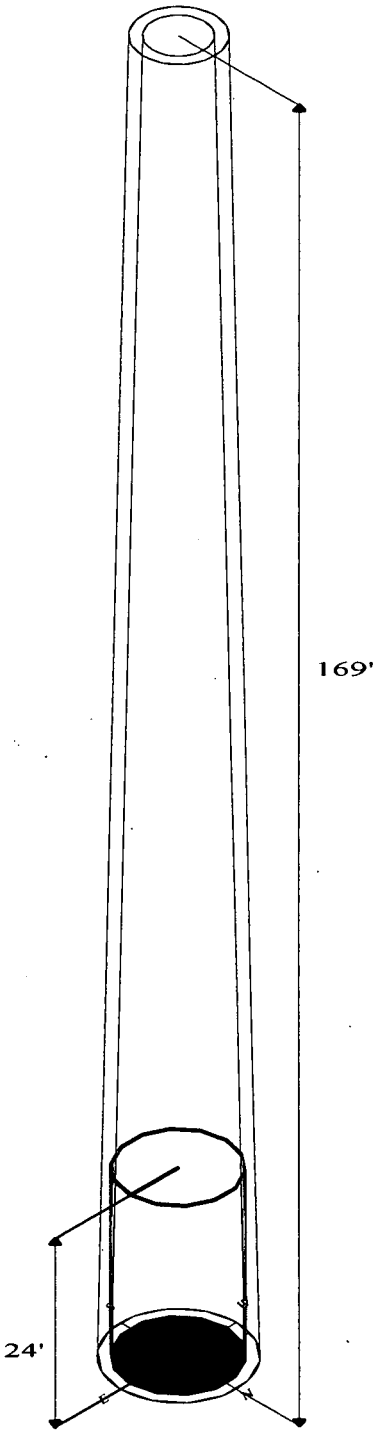
B771 Stack



Survey Unit
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